The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

December 4, 2018

Benjamin Wells
SHI-III Kingston, LLC
100 Jericho Quadrangle, Suite 142
Jericho, NY 11753
bwells@kapdev.com

Transmitted via Email

Subject: **Water Conservation Plan Approval**
Kingston – All American Assisted Living
Water Conservation Plan, NHDES # 004826

Dear Mr. Wells:

On December 4, 2018, the New Hampshire Department of Environmental Services ("DES") Drinking Water and Groundwater Bureau received a Water Conservation Plan (the "WCP"), signed on December 3, 2018, for All American Assisted Living, located in Kingston, New Hampshire. Pursuant to RSA 485:61 and Env-Wq 2101, community water systems seeking permits from DES for new sources of groundwater shall submit a water conservation plan to DES. Based on review of the WCP, DES has determined the WCP complies with Env-Wq 2101, *Water Conservation* rules.

Pursuant to Env-Wq 2101, the Town of Kingston and the Rockingham Planning Commission were provided a copy of the WCP, along with other required materials.

DES approves the WCP based on the following conditions:

1. No later than source activation, all source meters, distribution meters, meters measuring water consuming processes, and any transfer meters and data loggers shall be installed.

2. Upon source activation, source meters and any other meters measuring water consuming processes prior to distribution shall be read monthly, no sooner than 27 days and no later than 33 days from the last meter reading.

3. All meters shall be installed per the manufacturer's instructions or American Water Works Association standards.

4. Upon source activation, all meters shall be tested and maintained based on the schedule proposed in the WCP.

5. Upon source activation, monthly source production volumes shall be reported to the DES Water Use Registration and Reporting Program on a quarterly basis. Upon source activation, DES will assign the system a Water Use Identification Number and provide instructions for registering as a data provider and utilizing the DES OneStop reporting tool.

6. Upon source activation, a distribution meter shall be installed and night flow analysis shall commence at a rate of twice a year in accordance with the night flow analysis methodology in the WCP.

7. Leaks shall be repaired within 60 days of discovery.

8. From the date of this approval, all non-metallic pipes installed in the system shall be outfitted with detectable tracer tape or detectable tracer wire, or be GPS located and maintained in a GIS system.

9. Upon source activation, a water conservation outreach and education program shall be implemented in accordance with the WCP, including educating staff at the facility.

10. All water water-using fixtures, appliances, and equipment shall meet the most current water efficiency and energy efficiency standards as listed in Appendix D of the WCP.

11. As water-using fixtures, appliances, and equipment are replaced, ENERGY STAR and WaterSense certified models shall be installed.

12. All water used for irrigation shall be regulated with smart controllers with soil moisture, rain, and/or weather sensors.

13. No later than the source activation date, the system shall submit the water efficiency best management practice information listed in section II.D.4. of the WCP to DES.

14. Every three years from the date of this approval, a *Water Conservation Plan Ongoing Compliance Reporting Form* shall be submitted to DES documenting how the system has maintained compliance with the WCP. The following records shall be maintained by the water system to include with the report:

    a. Date of installation and replacement of all meters as well as testing and calibration records.

    b. Data from biannual night flow analyses, a brief summary of the analyses, and the associated leak repair activities.

    c. Number/Inventory of fixtures and appliances replaced during the reporting period.

    d. A log of water conservation outreach activities, including the dates of staff meetings where water conservation measures were mentioned and a summary of the outreach materials posted within the building.

15. Proposed changes to the WCP shall not be implemented unless approved by DES.

The *Water Conservation Plan Ongoing Compliance Reporting Form* may be located by going to the DES website (www.des.nh.gov), clicking on the "A-Z List" in the top right corner of the page, clicking "Water Conservation," and scrolling down to "Forms/Applications."

Please feel free to contact me with any questions at (603) 271-0659 or via e-mail at kelsey.vaughn@des.nh.gov.

Sincerely,

Kelsey Vaughn

Kelsey Vaughn
Water Conservation Program
Drinking Water and Groundwater Bureau

ec: Neil Helberg; Lewis Engineering, PLLC
Town of Kingston
Danna Truslow; Truslow Resource Consulting, LLC
Rockingham Planning Commission
Andrew Koff, Stacey Herbold; DES

WATER CONSERVATION PLAN:
ALL AMERICAN ASSISTED LIVING
November 2018

A community water system seeking authorization for a new source of water must submit a water conservation plan to the New Hampshire Department of Environmental Services (NHDES) for approval demonstrating how the water system proposes to comply with water conservation standards pursuant to Env-Wq 2101, *Water Conservation* rules. All American Assisted Living is a new landlord owned community water system, which is also considered an Industrial, Commercial, Institutional (ICI) water user.

Activities outlined in the water conservation plan will be completed by water system personnel under the supervision of a certified water system operator.

I. Introduction

A. Contact Information

1. Name and location of system:
   All American Assisted Living – Main St & Rte. 125, Kingston, NH

2. Owner of system and mailing address:
   SHI-III Kingston, LLC
   100 Jericho Quadrangle, Suite 142
   Jericho, NY 11753
   516-496-1505

3. Name and mailing address of preparer of water conservation plan:
   Neil W. Helberg, P.E.
   Lewis Engineering, PLLC
   44 Stark Lane, Litchfield, NH 03052
   603-886-4985

B. System Overview

1. Description of the community being served:
   All American Assisted Living is a proposed assisted living facility with 58 units in one building. The units are proposed as 4 types: 1-bedroom unit with a bathroom, 2-bedroom unit with a shared bathroom, 1-bedroom unit with a bathroom and kitchenette, and 2-bedroom unit with a shared bathroom and kitchenette (also known as a companion suite). The current plan includes 2 1-bedroom units with a bathroom, 2 1-bedroom units with a bathroom and kitchenette, 11 2-bedroom units with a shared bathroom, and 43 2-bedroom units with a shared bathroom and kitchenette. It is anticipated that each kitchenette will include a sink, and each bathroom will include a sink, toilet, and shower.

There will be a large and small commercial kitchen in the facility. The current plan includes a commercial laundry room and 3 common area laundry rooms. A beauty salon will be available to residents, although it is anticipated that less than 20 percent of residents will utilize that service. The facility will also include bathrooms, janitor's closets, a wellness center, and an employee lounge. At full capacity, the facility will have 112 residents and 60-70 part-time and full-time staff.

2. Description of water sources:

   The water system will be supplied by two bedrock wells. Bedrock Well No. 1 is located 320 feet south of the proposed facility. Bedrock Well No. 2 is located 384 feet south of the proposed facility. The meters and treatment are planned to be located in a separate building/pump house. Water from these sources will supply the facility and may be used for irrigation.

   The fire water cisterns with the fire pump are separate from the domestic water system. After installation, the wells may be used to initially fill them—a total of 15,000 gallons. This will be before any water is being used in the building or the system in general. After that time, a small amount of water may be added once or twice per year, depending on the schedule for testing the fire sprinklers inside the building. This would only amount to approximately 200 gallons total.

3. Name designation of each proposed water source:

   Bedrock Well No. 1 and Bedrock Well No. 2

4. Number of connections proposed for each of the following classes:
   a) Residential: 0
   b) Industrial/Commercial/Institutional: 1
   c) Municipal: 0

5. The water system does not plan to provide water to any consecutive water systems or privately owned redistribution systems.

6. There are no proposed connections that will receive more than 20,000 gpd.

C. Transfer of Ownership

1. The system ownership is not proposed to be transferred.

II. System Side Management

A. Water Meters

1. Source Meters and Other System Side Meters

   a) No later than the source activation date, a meter will be installed on each water source.

   b) No later than the source activation date, a distribution meter will be installed to measure flow at the point of entry into the water system.

   c) No separate irrigation wells are proposed at this time.

d) Meter make, model, size and flow range of proposed meters for each new water source and other system side meters (if known):

Each source meter will be a 1 inch Badger M2000 magnetic meter.

The distribution meter will be a 2 inch Badger M2000 magnetic meter with transmitter. The pump house control panel for the water system controls the operation of the booster pumps based on a 4-20mA signal from the meter's transmitter. There will be a bypass around the meter with a normally closed valve. This will only be used if the distribution meter is out of service for testing or repair.

Any water used for outdoor irrigation will be metered with a 1 inch Neptune T-10 positive displacement water meter. The 1 inch Neptune T-10 meter has a flow range of 1 to 50 gpm.

e) No later than the source activation date, source meters and other system side meters will be read at least monthly. A GS-300 cell based monitoring/alarm system is planned to be installed.

2. Meter Selection, Installation and Maintenance

a) All meters will be American Water Works Association (AWWA) certified.

b) The selected size of the meters will be based on projected flow rates.

c) Meters will be installed as specified by the manufacturer, including requirements for horizontal or vertical placement, distance of straight run of pipe upstream and downstream of the meter and strainer installation. If the manufacturer does not supply installation specifics, meters will be installed in accordance with the "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance" (AWWA, 2012).

d) The following meter testing and calibration schedule or meter change-out schedule will be implemented. If the manufacturer's accuracy warranty extends beyond the schedule below, the meter will be tested or changed-out no later than the warranty expiration date.

Meter Size (inches)	**Testing Rate (years)**
<1"	10 yrs
1" - 2"	4 yrs
3"	2 yrs
>3"	1 yr

e) A log of the date when meters were installed, tested, calibrated, repaired and replaced will be maintained. Calibration certificates will be kept on file.

B. Pressure Management

1. The design pressures of the system are from 65 psi to 75 psi.

C. Leak Detection and Repair

1. A leak detection program will be implemented upon source activation. The leak detection program will be as follows: night flow analysis.

a) The system will conduct a night flow analysis at least twice a year.

b) A distribution meter capable of reading low flows will be installed on the distribution line. The make, model, and size of the proposed distribution meter is: 2 inch Badger M2000 magnetic meter.

c) See Appendix B for the night flow analysis methodology.

2. All non-metal pipes will either be GPS located and stored in a GIS system or equipped with detectable tracer tape or detectable tracer wire.

3. Leak detection methodologies will be conducted in accordance with the "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (AWWA, 2016).

4. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.23.

5. A log of all leaks will be maintained, including the date the leak was discovered, the date the leak was repaired, the type of leak (ex. service, main, hydrant, valve), the size of the leak (gpm) and the location of the leak.

D. Water Conservation Best Management Practices

1. The facility will be designed and developed using water efficiency best management practices. Water efficiency best management practices will be used as described in:

-NHDES Fact Sheet DWGB-26-10 (Water Efficiency: Laundry Facilities): https://www.des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-10.pdf
-NHDES Fact Sheet DWGB-26-13 (Water Efficiency: Institutions): https://www.des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-13.pdf
-NHDES Fact Sheet DWGB-26-14 (Water Efficiency: Health Care Facilities): https://www.des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-14.pdf
-EPA Guide "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities": https://www.epa.gov/sites/production/files/2017-02/documents/watersense-at-work_final_508c3.pdf

2. Water from the system's wells will be primarily used for sanitary purposes. The facility will have at least resident and employee bathrooms, kitchenettes in some of the residential units, common area laundry rooms, an industrial kitchen, and industrial laundry facilities.

a) The facility will be equipped with water-using fixtures, appliances, and equipment that are WaterSense certified and/or ENERGY STAR certified.

(1) WaterSense certified products include toilets, urinals, faucets, showerheads, and pre-rinse spray valves. Products may be found at: https://www.epa.gov/watersense/product-search.

(2) ENERGY STAR certified products include, but are not limited to, commercial dishwashers, ice makers, steam cookers, clothes washers, and clothes dryers. Products may be found at: https://www.energystar.gov/products.

b) If some or all of the water-using fixtures, appliances, and equipment have already been purchased or installed, then those products must meet the most current water efficiency and energy efficiency standards as listed in Appendix D. If they do not meet those standards or need to be replaced, they will be replaced with products that are WaterSense certified and/or ENERGY STAR certified.

3. Water from the system's wells may also be used for outdoor irrigation.

a) Any water used for outdoor irrigation will be regulated with smart controllers with soil moisture, rain, and/or weather sensors.

b) WaterSense labeled products include irrigation controllers and spray sprinkler bodies. Products may be found at: https://www.epa.gov/watersense/product-search.

4. No later than the source activation date, the system will submit the following information to the NHDES Water Conservation Program:

-Number of residents at that time and at full capacity;
-Number of employees at that time and at full capacity;
-A list and description of all water uses at the facility;
-Number and type of water-using fixtures throughout the facility and whether they are WaterSense certified;
-Number, type, make, and model of water-using appliances and equipment throughout the facility and whether they are WaterSense or ENERGY STAR certified;
-Confirmation of whether an irrigation system was installed, the make and model of the irrigation controller, and the maintenance plan for the irrigation system;
-Details about the heating/cooling system if it uses water; and
-Details about any additional water efficiency features and best management practices not covered in this water conservation plan or included with the information related to the above bullets.

III. Consumption Side Management

A. Educational Outreach Initiative

1. No later than the source activation date, the system will implement water conservation outreach by educating staff at the facility. Water conservation information will be posted in the break room, reminding staff of water conservation tips. An agenda item will be added to the periodic in-service meetings with all staff to remind staff of the importance of water conservation and the notification process for suspected leaks or leaky fixtures.

a) Information contained in EPA WaterSense materials located at http://www.epa.gov/watersense/ or NHDES Water Efficiency Fact Sheets located at http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm#efficiency will be used as reference materials.

2. The system will maintain a log indicating how the system has complied with III. A.1., above. The log will include dates the outreach and education actions were taken and what was done.

IV. Reporting and Implementation

A. The water system will submit a form supplied by NHDES once every three years from the date of the water conservation plan approval documenting how compliance with the requirements of Env-Wq 2101, *Water Conservation* rules, is being achieved. The system will use the meter, leak, and outreach and education logs to complete the form.

B. The data collected with each night flow analysis from the previous three years, as well as a statement as to whether a leak was suspected or not, will be submitted with the report form in IV.A., above.

C. The water system will report monthly production volumes quarterly to the NHDES Water Use Registration and Reporting Program upon receiving a Water Use ID number from NHDES. Monthly means once every calendar month, but no sooner than 27 days after and no later than 33 days after the previous reading.

I certify that I have read this Water Conservation Plan, understand the responsibilities of the water system as referenced in the plan, and that all information provided is complete, accurate, and not misleading.

Owner Name (print): Glenn Kaplan Managing Member

Owner Signature: Glenn Kaplan Date: 12-3-18

Appendix A
Definitions

Authorized metered consumption: billed metered water plus unbilled metered water.

Community water system (CWS): a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Consecutive water system: a public water system that buys or otherwise receives some or all of its finished water from one or more wholesale systems for at least 60 days per year.

Final source approval: the date of final well siting approval or the date of issuance of the large groundwater withdrawal permit.

Large community water system: a community water system that serves more than 1,000 persons.

Privately owned redistribution system (PORS): A system for the provision of piped water for human consumption which does not meet the definition of a public water system and meets all the following criteria:

(1) Obtains all its water from, but is not owned or operated by, a public water system; (2) serves a population of at least 25 people, 10 household units or 15 service connections, whichever is fewest, for at least 60 days per year; and (3) has exterior pumping facilities, not including facilities used to reduce pressure, or exterior storage facilities which are not part of building plumbing.

Public water system (PWS): a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Small community water system: a community water system that serves 1,000 people or less.

Source activation date: the date the source is placed into use.

System input volume: the volume of water input to the water supply system after treatment, analysis and storage.

Water balance: the difference between the system input volume and authorized metered consumption.

Water conservation: any beneficial reduction in water losses, waste or use.

Wholesale system: a public water system or an industrial, commercial or institutional (ICI) water user that treats source water and then sells or otherwise delivers finished water to a consecutive water system or privately owned distribution system.

Appendix B
Night Flow Analysis Methodology

1. Distribution Meter

    a. A 2 inch Badger M2000 magnetic meter capable of measuring low flows will be installed on the distribution line and located after treatment, any other water consuming processes, and storage.

    b. If the distribution meter is replaced, the meter make, model, and size will be forwarded to NHDES prior to purchase/installation for review and approval.

2. Determining Baseline Flow

    a. When the system is approved for operation and pressure tested to ensure for no leaks, the night flow analysis will be conducted as described in Section 3, below. The baseline flow will be the lowest flow recorded.

    b. The results of the analysis and the proposed baseline flow will be submitted to NHDES for review.

3. Night Flow Analysis

    a. Night flow analysis will be conducted at least twice a year and no sooner or later than 6 months apart.

    b. Water usage will be recorded every minute for one hour between 1 am and 3 am using a distribution meter. Prior to the night flow analysis, users of the system will be requested to refrain from using water between 1 am and 3 am on this date. (Night flow analysis will be conducted prior to sprinkler season.)

    c. If the low flow is above the baseline, then flows will continue to be recorded for an additional hour.

    d. If the low flow is more than 2 gpm above the baseline, a leak will be suspected.

        1. All residents will be asked to check their units for leaks, including running toilets. The previous steps will then be repeated in 3 days. If the low flow is still above the baseline, the actions in Steps 2 and 3 below will be taken.

        2. If the leak continues, all water-using fixtures and appliances in the building will be inspected for leakage and select portions of the water system will be isolated and evaluated by closing valves while monitoring the change in flow as measured by the distribution meter.

        3. No later than two weeks after isolating the leak to a branch of the system, a sub-contractor skilled in acoustic leak detection will be retained and will assist with pinpointing the leak if the leak is suspected to be in the distribution system. If the cause of the leak is from broken fixtures or appliances, those devices will be repaired or replaced.

    e. Records will be maintained of each night flow analysis, including recorded flows and leak detection results.

Appendix C
Notification Process

Public Notification Instructions
Once a final draft of the water conservation plan is agreed upon by the applicant and NHDES, NHDES will send a signature line to the applicant for addition to the plan along with a summary of the requirements of Env-Wq 2101, *Water Conservation* rules. Within 10 working days of receiving the summary from NHDES, the applicant is required to provide a copy of the water conservation plan via certified mail with return receipt requested to the governing board of the municipality in which a proposed source is located, all municipalities that will receive water from the water system (if any), all wholesale customers (if any) and the regional planning commission serving the location of the proposed source. In most cases, only the municipality and the regional planning commission will require notification. All signed copies of the certified mail return receipts (the green cards) must be forwarded to NHDES along with the final, signed water conservation plan.

Additional Attachments
The applicant must provide the governing boards with a summary of the requirements of Env-Wq 2101, which may be found at http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm, and request that the governing board amend local site planning requirements to reflect the requirements of Env-Wq 2101 or to promote water efficiency.

Notification of Consecutive Water Systems and Privately Owned Redistribution Systems
Within 5 working days of obtaining final approval of the source from NHDES, the system is required to notify any consecutive water system or privately owned redistribution system receiving water from the system, that pursuant to Env-Wq 2101.13, the systems must implement a water conservation plan and should contact the NHDES Water Conservation Program using the contact information below.

Kelsey Vaughn, Water Conservationist
New Hampshire Department of Environmental Services
Drinking Water and Groundwater Bureau
PO Box 95
Concord, NH 03302-0095
kelsey.vaughn@des.nh.gov
Phone: (603) 271-0659
Fax: (603) 271-0656

National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

(Compiled from information provided by the Alliance for Water Efficiency, U.S. EPA Office of Water, U.S. Dept. of Energy, Energy Star, Consortium for Energy Efficiency, and other sources)

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency (CEE)	
	Current Standard	Proposed/Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed/Future Specification
Residential Toilets (Water Closets)	**≤ 1.6 gpf**[1]	**≤ 1.28 gpf/ 4.8 Lpf** proposed by efficiency advocates (tank-type only)	**Tank-type toilets: WaterSense v.1.1 = ≤ 1.28 gpf (4.8L)** with at least 350 gram bulk waste removal **Flushometer valve/bowl combinations:** No WaterSense specification	**Tank-type toilets:** Some modifications planned to bring WS into partial synch with the ASME/CSA harmonized national standard. Mods will not change flush volume. **Flushometer valve/bowl combinations:** Specification in development	No specification	
Residential Lavatory (Bathroom) Faucets	**≤ 2.2 gpm at 60 psi**[2]	**≤ 1.5 gpm/ 5.7 Lpm** proposed by efficiency advocates	**WaterSense: ≤ 1.5 gpm & 0.8 gpm minimum at 20 psi**	No change to existing specification is planned	No specification	
Residential Kitchen Faucets			**WaterSense:** No specification	No specification proposed at this time	No specification	
Residential Showerheads	**≤ 2.5 gpm at 80 psi**		**WaterSense**: **≤ 2.0 gpm** with spray force & coverage requirements	No change to existing specification is planned	No specification	

[1] EPAct 1992 standard for toilets applies to both commercial and residential models.
[2] EPAct 1992 standard for faucets applies to both commercial and residential models.

DOE: Department of Energy
EPA: Environmental Protection Agency
EPAct 1992: Energy Policy Act of 1992
EPAct 2005: Energy Policy Act of 2005
EF: energy factor
WF: water factor
gal: gallons ft^3: cubic feet
gpm: gallons per minute
gpf: gallons per flush
kWh: kilowatt hour
MEF: modified energy factor
MaP: maximum performance
NAECA: National Appliance Energy Conservation Act
psi: pounds per square inch Lpf: Litres per flush

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Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency (CEE)	
	Current Standard	**Proposed/Future Standard**	**Current Requirements**	**Proposed/Future Requirements**	**Current Specification**	**Proposed/Future Specification**
Residential Clothes Washers	MEF ≥ 1.26 ft^3/kWh/cycle (Standard front- and top-loading models only) **WF ≤ 9.5 gal/cycle/ft^3** Note: MEF measures energy consumption of the total laundry cycle (wash + dry). The higher the number, the greater the energy efficiency	DOE has published a proposed rule for machines made between March 7, 2015 and Jan. 1, 2018 as follows: For STANDARD washers of ≥ 1.6 ft^3 (a) front loading: MEF=1.84 & **WF ≤ 4.7** (b) top loading: MEF =1.29 & **WF ≤ 8.4** For SMALL (compact) washers of ≤ 1.6 ft^3 : (a) front loading: MEF=1.13 & **WF ≤ 8.3** (b) top loading: MEF=0.86 & **WF ≤ 14.4** DOE has also published a proposed rule for machines made after Jan 1, 2018: For STANDARD washers of ≥ 1.6 ft^3 (a) front loading: MEF=1.84 & **WF ≤ 4.7** (b) top loading: MEF =1.57 & **WF ≤ 6.5** For SMALL (compact) washers of ≤ 1.6 ft^3 : (a) front loading: MEF=1.13 & **WF ≤ 8.3** (b) top loading: MEF=1.150 & **WF ≤ 12.0**	**Energy Star (DOE):** **Effective February 1, 2013 for 1.6 to 6.0 ft^3** MEF ≥ 2.0 **WF ≤ 6.0 gal/cycle/ft^3** New: Energy Star Most Efficient (Tier 2 Energy Star)	Energy Star will likely modify the current specification on or before March 7, 2015.	Effective Jan 1, 2011 *Tier 1:* MEF ≥ 2.0 ft^3/kWh/cycle; **WF ≤ 6.0 gal/cycle/ft^3** *Tier 2:* MEF ≥ 2.2 ft^3/kWh/cycle; **WF ≤ 4.5 gal/cycle/ft^3** *Tier 3:* MEF ≥ 2.4 ft^3/kWh/cycle; **WF ≤ 4.0 gal/cycle/ft^3**	

DOE: Department of Energy
EPA: Environmental Protection Agency
EPAct 1992: Energy Policy Act of 1992
EPAct 2005: Energy Policy Act of 2005
EF: energy factor
WF: water factor
gal: gallons ft^3: cubic feet
gpm: gallons per minute
gpf: gallons per flush
kWh: kilowatt hour
MEF: modified energy factor
MaP: maximum performance
NAECA: National Appliance Energy Conservation Act
psi: pounds per square inch
Lpf: Litres per flush

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency (CEE)	
	Current Standard	Proposed/Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed/Future Specification
Standard Size and Compact Residential Dishwashers[3]	Final Rule of DOE, effective 5/30/2013: STANDARD Size Models: Energy: ≤ 307 KWh/year **WF ≤ 5.0 gallons/cycle** COMPACT Models: Energy: ≤ 222 kWh/yr **WF ≤ 3.5 gallons/cycle**		**Energy Star v.5.0 (DOE)** **Eff. Jan 20, 2012:** STANDARD Size Models: Energy: ≤ 295 kWh/year **WF ≤ 4.25 gallons/cycle** COMPACT Models: Energy: ≤ 222 kWh/year **WF ≤ 3.5 gallons/cycle**	A second, more efficient, tier may be developed.	Effective Jan. 20, 2012: *Standard size models (8 place settings or more):* EF ≥ 0.75 cycles/kWh; and 295 max kWh/year; **WF ≤ 4.25 gallons/cycle** *Compact size models (hold fewer than 8 place settings):* EF ≥ 1.0 cycles/kWh; 222 max kWh/year; **WF ≤ 3.5 gallons/cycle**	Could adjust tiers when new Energy Star becomes effective

[3] ***Standard models*****:** capacity is greater than or equal to eight place settings and six serving pieces; ***Compact models*****:** capacity is less than eight place settings and six serving pieces

National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

(Compiled from information provided by the Alliance for Water Efficiency, U.S. EPA Office of Water, U.S. Dept. of Energy, Energy Star, Consortium for Energy Efficiency, and other sources)

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, "Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed /Future Specification
Commercial Toilets (Water Closets)	**≤ 1.6 gpf[4]/6.0 Lpf** Except blow-out fixtures: **≤ 3.5-gpf/13 Lpf** *(Note: Some states prohibit blow-out at 3.5 gpf)*	**≤ 1.28 gpf - 4.8 Lpf** proposed by some efficiency advocates (tank-type only)	**WaterSense - Tank-type toilets only:** **≤ 1.28 gpf (4.8L)** with at least 350 gram bulk waste removal **Flushometer valve/bowl combinations:** No WaterSense specification	**Flushometer valve/bowl combinations:** WaterSense specification in development. Release expected in 2014.	No specification	
Commercial Urinals	**≤ 1.0 gpf**	**≤ 0.5 gpf - 1.9 Lpf** proposed by efficiency advocates	**WaterSense – Flushing urinals only:** **≤ 0.5 gpf/1.9Lpf** *(Note: non-water urinals not covered by WaterSense)*	No change to existing specification is planned	No specification	
Commercial Faucets	**ANSI Standard:** Private (single-user) faucets, including residential within commercial bldg **≤ 2.2 gpm @ 60 psi[5]** All other commercial (except metering) per ANSI standard **≤ 0.5 gpm at 60 psi[5]** Metering (auto shut off) faucets **≤ 0.25 gallons per cycle[6] (no maximum flow rate)**		No specification	Creating a WaterSense draft specification is currently under consideration; no spec is under development, however.	No specification	

[4] EPAct 1992 standard for toilets applies to both commercial and residential models.

[5] In addition to EPAct requirements, the American Society of Mechanical Engineers/Canadian Standards Association standard for public lavatory faucets is 0.5 gpm at 60 psi (ASME A112.18.1/CSA B125.1). This maximum has been incorporated into the national model plumbing codes for all except private applications, private being defined as residential, hotel guest rooms, and health care patient rooms. All other applications subject to the 0.5 gpm/1.9 Lpm flow rate maximum.

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed /Future Specification
Commercial Clothes Washers	As of Jan 9, 2013: Top loaders: 1.6 MEF and **WF ≤ 8.5 gal/cycle/ft^3** Front loaders: 2.0 MEF and **WF ≤ 5.5 gal/cycle/ft^3**		**Energy Star :** **Effective February 1, 2013** 2.2 MEF and **≤ 4.5 WF gal/cycle/ft^3** For both front and top loaders (NOTE: defined as a soft-mounted front or top loading machine for use in common area and coin-op laundries with capacity greater than 1.6 cubic feet and not a combo washer-dryer; does **NOT** include multi-load, high-volume machines used in on-premise or commercial laundries)		As of January 9, 2013, CEE specification is no longer active.	Considering reinstatement in 2014 or later

[6] Metering faucets not subject to flow rate maximum

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, "Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed /Future Specification
Commercial Dishwashers	No standard		**Energy Star v.2.0 - Effective 2/1/2013:** ***Under counter:*** Hi Temp: ≤ 0.86 gal/rack; ≤ 0.5 kW; Lo Temp: ≤ 1.19 gal/rack; ≤ 0.5 kW ***Stationary Single Tank Door*:** Hi Temp: ≤ 0.89 gal/rack; ≤ 0.7 kW; Lo Temp: ≤ 1.18 gal/rack; ≤ 0.6 kW ***Pot, Pan, and Utensil*** Hi Temp: ≤ 0.58 gal/rack; ≤ 1.2 kW; Lo Temp: ≤ 0.58 gal/rack; ≤ 1.0 kW ***Single Tank Conveyor*:** Hi Temp: 0.70 gal/rack; ≤ 1.5 kW; Lo Temp: 0.79 gal/rack; ≤ 1.5 kW ***Multiple Tank Conveyor*:** Hi Temp: 0.54 gal/rack; ≤ 2.25 kW; Lo Temp: 0.54 gal/rack; ≤ 2.0 kW ***Single Tank Flight Type:*** Requires formula for both hi and low temp machines: Gallons per hour (gph) ≤ 2.97 times sf of belt + 55 ***Multiple Tank Flight Type:*** Requires formula for both hi and low temp machines: Gph ≤ 4.96 times sf of belt +17 **NOTE: See full Energy Star requirements for definitions and details.**		Specification is 6 years old and is no longer applicable	CEE waiting for final test methods before reviewing possible changes to their specifications

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed /Future Specification
Automatic Commercial Ice Makers[7]	Effective January, 2010: Energy and condenser water efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table)		**Energy Star:** Energy and water efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table). Water cooled machines excluded from Energy Star		Energy and water (potable and condenser) standards are tiered and vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table)	
Commercial Pre-rinse Spray Valves (for food service appli-cations)	**Flow rate ≤ 1.6 gpm** (no pressure specified; no performance requirement)		**WaterSense:** **Flow rate ≤ 1.28 gpm** (includes key performance requirements)	No change to existing specification is planned by WS	No specification at this time	Specification in development

[7] Optional standards for other types of automatic ice makers are also authorized under EPAct 2005.

Fixtures and Appliances	Federal Standard: from EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007", NAECA updates, other sources		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Requirements	Proposed/Future Requirements	Current Specification	Proposed /Future Specification
Commercial Steam Cookers[8]	No standard		**Energy Star (EPA)** *Electric*: 50% cooking energy efficiency; idle rate 400–800 Watts *Gas*: 38% cooking energy efficiency; idle rate 6,250–12,500 British thermal units/hour *Energy Star has no specified water use factor		*Electric*: Same as Energy Star *Water Use Factor* (for both electric and gas models): Tier 1A: **≤ 15 gal/hr per compartment** Tier 1B: **≤ 4 gal/hr per compartment**	

[8] Idle rate standards vary for 3-, 4-, 5-, and 6-pan commercial steam cooker models.

DISCLAIMER: The information presented in these tables has been gathered from sources deemed to be reliable. However, neither the authors nor the organizations posting this listing on their websites make any guarantee as to its correctness, accuracy, completeness, or current status. Readers are strongly encouraged to perform their own research at the websites of the organizations cited herein, as well as with any other reliable sources of current information.

Readers are encouraged to report any incorrect or updated information to the author, John Koeller: koeller@earthlink.net

Information/materials on EPAct 2005/NAECA & other standards:

Clothes Washers and Residential Dishwashers:
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/39
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/46
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/67

Automatic Commercial Ice Maker Standards:
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/21
http://www.eere.energy.gov/buildings/appliance_standards/pdfs/epact2005_appliance_stds.pdf (page 119 STAT. 640)

Pre-rinse Spray Valves
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/54
http://www.eere.energy.gov/buildings/appliance_standards/pdfs/epact2005_appliance_stds.pdf (page 119 STAT. 632)

Information/materials on Energy Star specifications:

Clothes Washers
http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers

Residential Dishwashers
http://www.energystar.gov/index.cfm?c=revisions.residential_dishwashers

Commercial Dishwashers
http://www.energystar.gov/ia/products/commercial_food_service/comm_ice_machines/Ice_Machine_Final_Spec.pdf?cb5a-da39
http://www.energystar.gov/index.cfm?c=comm_dishwashers.pr_crit_comm_dishwashers

Automatic Commercial Ice Makers
http://www.energystar.gov/ia/products/commercial_food_service/comm_ice_machines/Ice_Machine_Final_Spec.pdf?aa6d-857b
http://www.energystar.gov/index.cfm?c=new_specs.ice_machines

Commercial Steam Cookers
http://www.energystar.gov/index.cfm?c=steamcookers.pr_steamcookers
https://www.energystar.gov/ia/partners/product_specs/program_reqs/Commercial_Steam_Cookers_Program_Requirements.pdf?55af-7192

Information/materials on WaterSense specifications:

Water Closets (Toilets)
http://www.epa.gov/watersense/products/toilets.html
http://www.epa.gov/watersense/docs/revised_het_specification_v1.1_050611_final508.pdf

Flushing Urinals
http://www.epa.gov/watersense/products/urinals.html
http://www.epa.gov/watersense/docs/urinal_finalspec508.pdf

Residential Bathroom Lavatory Faucets
http://www.epa.gov/watersense/products/bathroom_sink_faucets.html
http://www.epa.gov/watersense/docs/faucet_spec508.pdf

Residential Showerheads
http://www.epa.gov/watersense/products/showerheads.html
http://www.epa.gov/watersense/docs/showerheads_finalspec508.pdf

Commercial Pre-Rinse Spray Valves
http://www.epa.gov/watersense/products/prsv.html
http://www.epa.gov/watersense/docs/prsv-finalspec-091913-final-508.pdf

Information/materials on CEE specifications:

Residential Clothes Washers
http://library.cee1.org/sites/default/files/library/5927/CEE_CW_Spec_for_web_site.pdf

Residential Dishwashers
http://library.cee1.org/sites/default/files/library/9562/dw-spec_4.pdf

Commercial, Family-Sized Clothes Washers
http://www.cee1.org/com/cwsh/cwsh-main.php3

Commercial Ice-Makers
http://library.cee1.org/sites/default/files/library/4280/CEE_Ice_Machines_Spec_Final_Effective_01Jul2011_-_updated_equivalencies.pdf

Commercial Dishwashers
http://library.cee1.org/sites/default/files/library/4339/Dishwasher%20Specification%20FINAL%2020100101%20Branded.pdf

Pre-rinse Spray Valves
http://www.fishnick.com/equipment/sprayvalves/

Commercial Steam Cookers
http://library.cee1.org/sites/default/files/library/4245/CEE%20Steamer%20Specification%2020100901%20FINAL.pdf